DERWENT-ACC-NO: 2003-833688

DERWENT-WEEK: 200436

TITLE: Synthesis of superhard materials useful for making tools comprises exposing a mixture of nonhard material and an ultrafine powder crystal-forming additive to heat and pressure

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PRIORITY-DATA: 2002EA-000576 (April 18, 2002)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE
WO 03086971 A1	October 23, 2003	RU
AU 2003236208 A1	October 27, 2003	EN

DESIGNATED-STATES: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ
DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC
LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PH PL PT RO RU SC SD SE
SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW AT BE BG CH CY CZ DE
DK EA EE ES FI FR GB GH GM GR HU IE IT KE LS LU MC MW MZ NL OA PT RO SD SE SI
SK SL SZ TR TZ UG ZM ZW

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
WO2003086971A1	N/A	2003WO-EA00002	April 17, 2003
AU2003236208A1	Based on	2003AU-236208	April 17, 2003

INT-CL-CURRENT:

TYPE	IPC	DATE
CIPS	B01J3/06	20060101
CIPS	B24D18/00	20060101
CIPS	B24D3/14	20060101
CIPS	C01B21/064	20060101
CIPS	C01B31/06	20060101

ABSTRACTED-PUB-NO: WO 03086971 A1

BASIC-ABSTRACT:

NOVELTY - Synthesis of superhard materials by preparing a charge of material with a nonhard crystal phase, adding a crystal-forming additive and exposing the mixture to a temperature and pressure above predetermined values for a predetermined time comprises using an ultrafine powder as the crystal-forming additive.

DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(1) production of superhard tools by preparing a charge of materials with superhard and/or nonhard crystal phases, adding a crystal-forming additive as above, preforming a tool, and exposing it to a temperature and pressure above critical values for a predetermined time;

(2) production of superhard powders with a given particle size by preparing a charge of materials with a nonhard crystal phase, adding a crystal-forming additive as above, compacting the mixture, exposing it to a temperature and pressure above critical values for a predetermined time, and attacking the product with alkali.

USE - For producing superhard materials, e.g. diamond or cubic boron nitride or polycrystalline or composite materials based on them, especially in the manufacture of grinding and cutting tools.

ADVANTAGE - High yields (96-100%) of impurity-free superhard materials can be produced at relatively low temperatures (800-1000degreesC lower than for catalytic synthesis) and relatively low pressures.

EQUIVALENT-ABSTRACTS:

CHEMICAL ENGINEERING

Preferred Process: The additive is ultrafine diamond a particle size of 4-40 nm. The mixture comprises 0.99-99 wt.% charge material and 0.99-99 wt.% additive. The charge material is hexagonal boron nitride and the treatment temperature is above 500degreesC; or the charge material is graphite or a mixture of graphite and hexagonal boron nitride and the treatment temperature is above 700degreesC. The treatment time is 40-80 seconds.

A mixture of 5 wt.% graphite and 95 wt.% ultrafine diamond (UFD) was heated at 800degreesC and 6 MPa for 40 seconds. The product comprised 4% diamond, 1% graphite and 95% UFD. The conversion of graphite to diamond was 80%.

TITLE-TERMS: SYNTHESIS SUPERHARD MATERIAL USEFUL TOOL COMPRISE EXPOSE MIXTURE ULTRAFINE POWDER CRYSTAL FORMING ADDITIVE HEAT PRESSURE

DERWENT-CLASS: E36 L02 P61

CPI-CODES: E31-N03; L02-F03; L02-F05;

CHEMICAL-CODES:
Chemical Indexing M3 *01*
Fragmentation Code
C106 C730 C810 M411 M720 N104 N173 N515 Q451
Specific Compounds
R01776
Registry Numbers
200701

Chemical Indexing M3 *02*
Fragmentation Code
C106 C730 C810 M411 M730
Specific Compounds
R01776
Registry Numbers
200701

Chemical Indexing M3 *03*
Fragmentation Code
C106 C730 C810 M411 M730
Specific Compounds
R01778
Registry Numbers
200703

Chemical Indexing M3 *04*
Fragmentation Code
B105 B720 B730 B803 B831 C107 C800 C802 C803 C804
C806 C807 M411 M781
Specific Compounds
R01893
Registry Numbers
129417

UNLINKED-DERWENT-REGISTRY-NUMBERS: 1893U; 1893S

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: 2003-234599
Non-CPI Secondary Accession Numbers: 2003-666428